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Knowledge Of Cardiovascular Disease Risk Factors And Perception Of Risk In Women

Kimberly Kuykendall-Marlar

KNOWLEDGE OF CARDIOVASCULAR DISEASE RISK FACTORS AND PERCEPTION OF RISK IN WOMEN

by

KIMBERLY KUYKENDALL-MARLAR

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Knowledge of Cardiovascular Disease Risk

Factors and Perception of Risk in Women

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Kimberly Kuykendall-Marlar

D. Lynn Chilton
Professor of Nursing
Director of Thesis

Melinda Rush
Professor of Nursing
Member of Committee

Jessica Alexander
Instructor in Nursing
Member of Committee

Suzanne M. Baer
Director of the Graduate School

Abstract

More women than men are dying of cardiovascular disease. The misconception persists that heart disease is a "man's disease" and not an urgent health care issue for women. In the United States, heart disease kills more women than all cancers combined. In 1997, 228,679 women died due to cardiovascular disease, and 41,443 women died from breast cancer. Yet, women are still not assessed effectively for their risk factors for cardiovascular disease; therefore, women are under-diagnosed and under-treated for this disease. The purpose of this study was to evaluate women's knowledge of cardiovascular disease risk factors, assess their perception of risk, and evaluate the knowledge of women regarding signs and symptoms of a heart attack. The theoretical framework utilized for this study was Pender's Health Promotion Model. This model includes concepts that directly or indirectly influence decision making and actions of individuals in preventing disease. The research questions that guided this study were as follows: What is the perception of risk for women regarding cardiovascular disease? What is the knowledge level of women regarding

cardiovascular disease risk factors? And are women knowledgeable of heart attack signs and symptoms? The sample consisted of 59 adult females over 21 years of age in northeast Mississippi employed at local industrial sites who consented to participate in the study. Data were collected using the Women's Health Survey, which addressed knowledge of risk factors, perceptions of risk for cardiovascular disease, and knowledge of heart attack signs and symptoms. Descriptive statistics using measures of central tendency, including frequencies and percentages, were utilized to interpret the data. The study revealed that women did regard heart disease as their biggest health care risk (n = 20, 33%). Risk factor awareness addressed criteria including: family medical history, tobacco use, history of diabetes, hypercholesterolemia, depression or anxiety, and hypertension, height and weight, activity level, menopausal status, and stress level. The risk factors that were most prevalent for this sample were 23% (n = 14) aware of their cholesterol level, being overweight (BMI of 28), and identified themselves frequently irritable and stressed (n = 36, 61%). It was predetermined that 80% of the sample had to score 80% on the knowledge portion of the survey to be considered knowledgeable of signs and

symptoms of heart attack. Only 22 participants (38%) scored above 80% on the knowledge portion of the survey. The current research indicates that nurse practitioners need to focus on cardiovascular disease risk factors and instructions on sign and symptoms of heart attacks in women. Nurse practitioners should be aware that women and atypical symptomatology for cardiovascular disease presence and adapt their care and teaching to address the educational needs of this population. Recommendations for further research include larger scale studies to obtain a more demographically diverse group and conduction of research to assess the screening practices of nurse practitioners and cardiovascular disease awareness practices.

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Chapter I

The Research Problem

In the United States, cardiovascular disease is the leading cause of death. Cardiovascular disease (CVD) includes strokes and all forms of heart disease. CVD is not only responsible for mortality in today's society but also contributes significantly to the co-morbidity of the population. In the past, heart disease was acknowledged to be primarily a "man's disease." However, in recent years women have accounted for almost half of the deaths caused from heart attacks, yet many women do not perceive CVD as a significant risk. Currently, it is unknown if women are knowledgeable about signs and symptoms of CVD.

Establishment of the Problem

Cardiovascular disease includes many diseases of the heart and related systems, including coronary heart disease (CHD), hypertension (HTN), rheumatic fever and rheumatic heart disease, cerebrovascular disease (strokes), and venous and lymphatic complications. CVD is the leading cause of death in men and women in the United

States. The incidence for men is higher than women at midlife; however, as women grow older the gap narrows and their risk increases. In recent years CVD has become recognized as a disease that presents with different symptomatology in women as compared to men and is increasing in rates of mortality. In 1997 CVD was accountable for 228,679 deaths in women 50 years of age and older as compared to 41,443 deaths due to breast cancer (Anderson & Kessenick, 2001). Yet, women infrequently cite heart disease as a significant health issue. Because many women are not aware of their risk, the incidence of CVD risk factors, such as obesity, hypertension, and diabetes, continues to rise.

Researchers at the National Women's Law Center (2001) account for the rise of CVD in women as being typical because women tend to outlive men. Therefore, more women will develop CVD and their risk of this disease will be higher when compared to men because of their longevity. For women ages 25 to 44 years, CVD mortality rates are higher than breast cancer as a leading cause of death in this age group. Accidental death and other adverse events are the number one cause of death for this age group with CVD following second. Another theory for the rise in CVD in women is based on anatomy. Women are typically smaller in body size than men; therefore, their heart and blood

vessels are smaller. This ideologic factor may explain the premise that it will take less plaque to cause blockages in a woman's coronary arteries (National Women's Law Center, 2001).

Recent surveys indicate that 3 out of 10 women view heart disease as a major health risk. Fifty-two percent of women believe that their greatest health risk is breast cancer. Public health campaigns over the past decade have effectively promoted breast cancer screenings and mammograms. With this information so easily attainable to women, the perception that breast cancer is more fatal than CVD has increased. However, it has been shown that female heart attack patients have a higher incidence of death the year following a heart attack. Women also face a greater risk of having another heart attack in that same time period as compared to men (Williamson, 2001).

The American Heart Association estimated that more than 250,000 women die from CVD and 439,000 women would suffer a myocardial infarction this year. The cost of CVD, which includes strokes, is estimated to be $297 billion annually in direct health care costs and lost productivity (Lilly Center for Women's Health, 2002). Within 6 years of a heart attack, 46% of women will be disabled due to congestive heart failure as compared to 22% of men (King et al., 2002).

Risk factors for CVD can be categorized as modifiable and non-modifiable. Non-modifiable risk factors are age, gender, family history, race, and socioeconomic status. Modifiable risk factors include tobacco use, obesity, hypertension, sedentary lifestyle, diet, high cholesterol, and diabetes. Risk factor assessment and counseling to encourage behavior modification have proven to be somewhat effective in reducing the risk of developing CVD.

Smoking is a major risk factor for the development of CVD in women. All women benefit from quitting smoking. Women cite various reasons for this habit including stress relief, anger, depression, boredom, and a form of weight control. In women who have heart attacks, it is two to six times more frequent in smokers than nonsmokers. Impressively, after one to 2 years of quitting cigarettes, the risk of CVD drops significantly. Trends of smoking among females have changed over the past decades. Twenty-two percent of women smoke, and the prevalence of female smokers is declining. However, women who are smokers tend to smoke more heavily than women in the past (Bedinghaus, Leshan, & Diehr, 2001).

Obesity is an independent marker for CVD and is a significant risk factor for women even if there are no other risk factors present. Being overweight contributes to the development of health care problems that are risk

factors for coronary heart disease, such as diabetes, hypertension, and high cholesterol. In America, 33.3% of women over 18 years of age are currently described as being overweight. Sedentary lifestyle is a risk factor that correlates with obesity. It is recommended that a person exercise five times a week for 30 to 45 minutes at a time. Exercise has been proven to help in the prevention of diabetes, lower blood pressure, and decrease cholesterol levels. The National Center of Health Statistics states that 39% of white women and 57% of women of color do not get enough physical exercise. Along with exercise, nutrition plays a role in controlling obesity. It is reported that women are not eating enough food selections from the fruit and vegetable groups. The recommendations are five servings from these groups per day. However, only 27% of women report meeting this requirement of fruits and vegetables on a daily basis (Bedinghaus et al., 2001).

High cholesterol, diabetes, and hypertension are disease processes that contribute to the development of CVD. These three disease risk factors increase the risk of heart attack significantly. High cholesterol and diabetes tend to affect the narrowing of the coronary arteries to decrease blood flow to the heart leading to CHD; whereas, hypertension increases the workload of the heart and over

time decreases the effectiveness of the mechanical pumping of the heart. High cholesterol and diabetes are risk factors that can be partially prevented by following a nutritional diet and exercise regimen. In *Healthy People 2000*, a goal was set to have cholesterol levels checked in 75% of the people over the age of 20 years and for screenings every 5 years following. In *Healthy People 2010*, this goal has been raised to 80% with recent surveys indicating 28% of the women have not had a cholesterol screening in the last 5 years (National Women's Law Center, 2001).

In the non-modifiable risk factors, age, race, and gender are predisposed. The risk of developing CVD increases significantly as women age. Coronary artery vessel size has been shown to be smaller in diameter in women than men. Researchers also indicate that once a woman has reached menopause, the incidence of heart attack increases to equal the risk that men face in the same age group. Whereas, previously men had a higher incidence of heart attacks when compared to women in earlier age groups. Among minority women, particularly African-American, CVD has a 69% higher mortality rate as compared to white women (Anderson & Kessenich, 2001).

Researchers have indicated that hormones may contribute to the theory of the differences of CVD

outcomes in men and women. Biological differences may add to the explanation of gender specific risk for CVD. Oral contraceptive use, hormone replacement, and menopause are a few of the risk factors for CVD that are unique to women. These independent risk factors tend to affect certain blood level associated with high triglycerides, diabetes, and hypertension. Specifically, high-density lipoprotein (HDL) and low-density lipoprotein (LDL) levels are target markers for associated CVD risk. Women with a high triglyceride level and a low HDL have a greater risk of CVD than men with similar levels. Studies with oral contraceptive use have been shown to elevate triglyceride levels as well as raise HDL levels, which may offer some sort of protection in women. Menopause and estrogen loss have been associated with causing changes in HDL and LDL levels as well as contributing to the development of diabetes and hypertension. Currently hormone replacement therapy (HRT) is controversial in determining if this is a protector or instigator for CVD as a secondary preventative measure (Anderson & Kessenich, 2001).

Family history determines one's risk for CVD by playing a part in genetics or environmental upbringing. Genetics may predispose one to certain risks of developing CVD such as inherited clotting factor abnormalities. The environment a person grew up in plays a role in potential

modifiable behaviors, such as activity levels, diet, and social habits that are developed from childhood. The amount of control a person has over the non-modifiable risk factors is minimal. Therefore, more attention must be paid to promote behavior modification for the risk factors that can be controlled (National Women's Law Center, 2001).

The major symptom of a heart attack for both men and women is chest pain. Men typically experience crushing chest pain, nausea, cool or clammy skin, and diaphoresis. However, many women report symptoms that may not be associated with CVD or a heart attack. Women tend to present to health care facilities complaining of indigestion, abdominal pain, shortness of breath, fatigue, flushing, and diaphoresis. These symptoms may occur over hours or days rather than minutes. Women also tend to wait longer than men to seek treatment for these symptoms. Additionally, women may not be aware of the atypical symptoms of a myocardial infarction, which may contribute to their increased wait time in seeking treatment. Due to these atypical chest pain symptoms, many times women are sent home or the symptomatology is not investigated thoroughly and the discomfort is contributed to hormonal changes (National Women's Law Center, 2001).

These gender specific differences have been presented to provide an explanation for the increased number of women diagnosed with CVD. Even though these differences are being brought to the public's attention, a number of women are not aware of their risk for CVD. Furthermore, for those women who may be aware of the risk factors for CVD, many do not perceive themselves as candidates for CVD. Therefore, the purpose of this study was to evaluate women's knowledge of CVD risk factors and assess their perception of risk for this disease as well as their knowledge of signs and symptoms of a myocardial infarction.

Significance to Nursing

The advanced practice nurse (APN) provides primary care to adults. Family nurse practitioners (FNP) are in a unique position to assess CVD risk factors, individual perceptions of risk, and plan preventative risk reduction strategies for both men and women. Primary and secondary prevention is significant to reducing the incidence of CVD in women. The FNP is in a critical area for opening communication with clients to address these issues.

FNPs play an important role in that they provide primary health care services to all ages, races, and classes. Nurse practitioners have the opportunity to

educate and increase awareness for those in lower socioeconomic classes. These individuals are in desperate need of risk factor screenings, preventative education plans, and financial assistance for medication provision.

Opportunities continue for health care providers to address CVD risk in women. In a recent survey, 59% of women who visit a health care provider on a regular basis reported that they had never been talked to about CVD (King et al., 2002). The challenge of raising self-perception of risk among women about their biggest health threat is an important issue for health care providers. Important information on how women perceive their health risk, how much they worry about the risk, and how they receive their information regarding cardiovascular disease is a continuing concern. Women's perception of risk for CVD implies that health care providers are not getting the educational information across to women, which is needed to strengthen the understanding of CVD. This information is necessary to evaluate the effectiveness of preventing heart disease in women.

Theoretical Framework

Pender's Health Promotion Model was the theoretical framework utilized in this study. Pender provides the basis of how individuals make decisions about their own

health care and what factors influence these decisions regarding health care promotions. Pender has identified certain factors that are modified by the individual, such as situational, personal, and interpersonal characteristics that lead to behaviors consistent with health promotion.

The Health Promotion Model includes seven factors that may motivate the individual toward health promotion behaviors: importance of health, perceived control of health, perceived self-efficacy, definition of health, perceived state of health, perceived benefits of behaviors, and perceived barriers to health-promoting behaviors. Age, gender, education, income, body weight, family pattern of health care behaviors, and expectations of significant others are modifiable factors that also play a role in health care behavior outcomes. These factors are viewed as a more indirect influence rather than cognitive-perceptual influence, which bears directly on behaviors (Pender, 1987).

In 1996 Pender added four new variables as factors that may influence health-promoting behaviors. One was prior related behavior as an attempt to determine future behavior outcomes influenced by successes or failures of past attempts with this behavior. Secondly, activity-related affect, which brings positive or negative feelings

of the individual, may influence the performance of that behavior. The third variable, commitment to a plan of action, is a key factor for determining the formalization of a planned strategy as a commitment to oneself or another. Finally, immediate competing demands and preferences refer to conflicts over which the person has decreased control (Tomey & Alligood, 1998).

The current study was designed to evaluate women's knowledge of cardiovascular disease risk factors, their perception of risk for this disease, and their knowledge of signs and symptoms of myocardial infarction. Utilizing Pender's Health Promotion Model, a framework was provided to understand why people react to certain stimuli in a certain way. The participant may have viewed their definition of health in one form, yet have been unaware of certain disease risk factors that could have altered their perceived health status. However, once made aware, the woman's perception of health or risk may be changed to include health-promoting decisions. If the participant sees health-promoting behaviors as having an impact on their actual risk of developing CVD, they may perceive this as an aspect of controlling their health and may change their view of their health status. By providing more research in this area, women may be able to make an informed decision as to behaviors they include or exclude

in their daily lives in order to prevent certain diseases, such as CVD.

Statement of the Problem

Cardiovascular disease is a significant health care issue for women. The current level of awareness regarding heart disease might be described as a mixture of incomplete knowledge and a decreased perception of risk. Therefore, more research is needed to explore causes for this occurrence. One proposed explanation is that women are not informed of the CVD risk factors. Secondly, if informed of their CVD risk, women still do not perceive themselves at risk on an individual basis. With an increased knowledge of CVD risk factor, women might choose to better modify their lifestyle and become more aware of their perceived risk of this disease.

Research Questions

This study was guided by the following research questions:

1. What is the perception of women regarding risk of cardiovascular disease?
2. What are the risk factors for cardiovascular disease in women?
3. Are women knowledgeable about signs and symptoms of a myocardial infarction?

Definition of Terms

For clarification of the study, the following terms were defined:

1. *Perception*

   Theoretical: to become aware of something directly through one of the senses especially sight or hearing *(Merriam-Webster Dictionary,* 1999).

   Operational: the understanding and awareness of the risk for cardiovascular disease as defined by the Women's Health Survey.

2. *Women*

   Theoretical: an adult female over the age of 21 years.

   Operational: an adult female over the age of 21 years employed at selected industrial sites who completed the Women's Health Survey.

3. *Cardiovascular disease*

   Theoretical: a disease process involving the heart and blood vessels (*Merriam-Webster Dictionary,* 1999).

   Operational: a disease process involving the heart and blood vessels, which is affecting women as shown on the Women's Health Survey.

4. *Risk factors*

   Theoretical: indicators that researchers have shown to be a contributing input to the development of a disease process *(Merriam-Webster Dictionary,* 1999).

   Operational: indicators established through research as contributing to the development of heart and blood vessel disease as defined by the American Heart Association.

5. *Knowledgeable*

   Theoretical: To have attained or acquired information about a subject (*Merriam-Webster Dictionary,* 1999).

   Operational: acquired information regarding warning signs and symptoms of an impending myocardial infarction as determined by a score of 80% or more on the knowledge section of the Women's Health Survey in accordance with the American Heart Association guidelines. This predetermined score would indicate the subject was knowledgeable.

Assumptions

The following assumptions were made:

1. The knowledge level of cardiovascular disease risk factors can be measured in women.
2. The perception of risk and actual risk women have of cardiovascular disease can be determined.
3. Women have modifiable factors that play a role in cardiovascular health.

Summary

The purpose of this study was to evaluate the presence of cardiovascular disease risk factors in women, perceptions of risk for this disease in women, and to determine if women are knowledgeable of heart attack signs and symptoms. Recent studies have shown that women are not knowledgeable regarding CVD risk factors and that they do not perceive themselves at risk for this disease. Minimal research has been conducted in this area. A need for more research aimed at understanding the gender specific features of CVD related to women and how to improve women's health care by increasing the awareness of women and CVD are required.

Chapter II will provide a review of literature. The methodology used for this study will be described in Chapter III. Chapters IV and V will present the findings, outcomes, and their significance to nursing.

Chapter II

Review of the Literature

Research on women and cardiovascular disease reveals limited information for perception of risk of CVD. In this review of literature some studies will be reviewed that pertain to women and risk factor awareness, knowledge of acute myocardial infarction symptoms, and chronic illnesses pertaining to older women. With few literature reviews found where women's perception of risk for CVD was evaluated, the following review of literature discusses several studies pertaining to risk awareness, risk perception, symptom presentation as compared to men, and knowledge of risk-reducing behaviors.

King et al. (2002) sought to examine the presence of coronary risk factors and relationships between risk knowledge and risk assessment in women. Further, the researchers sought to evaluate the use of preventative treatments in women undergoing coronary angiography with a history of previous coronary interventions, including coronary artery bypass grafting (CABG) and coronary angioplasty (PTCA). Also included were women who had

reported symptoms suggesting risk of coronary heart disease.

Prior to coronary angiography, prospective subjects were informed of the study. Informed consent was obtained from a convenience sample of 450 women, and two nurse research coordinators interviewed the participants after the procedure. Four hundred and thirty interviews were conducted at the hospital, with the remainder conducted by phone interview.

King et al. (2002) developed the interview structure and questions specific to this study. The interview began with women being asked if they had ever been informed that they were at risk for CHD. Next, specific questions addressed risk assessment of CHD. Family history was addressed with a focus on first-blood relatives and the age of the family member when diagnosed. Women were then questioned regarding modifiable risk factors, including tobacco use, cholesterol level, physical activity level, height, and weight. Women were quizzed as to if they had been diagnosed with hypertension or diabetes mellitus. Pertinent medical history questions included if subjects had ever had a heart attack, PTCA, CABG, or a history of angina. Lastly, the participants were asked to list all current medications.

The median age of the sample was 64.5 years. The majority of women interviewed were Caucasian (94%) and postmenopausal. Half of the sample was married, and 41.5% of the participants had some college education. A comparison of women with and without previous CHD indicated that women with a previous history of CHD were more likely to be diabetic ($\chi^2 = 6.75$, $p = .09$) and have a family history of CHD ($\chi^2 = 4.44$, $p = .03$).

Most of the subjects interviewed had a history of tobacco use (58.1%), hypertension (58.7%), being overweight (66.2%), a family history of CHD, and had been informed by a health care provider that they had high cholesterol (66.7%). Also, 50% of the sample stated that they did not participate in a regular exercise program.

Eighty-three percent ($n = 376$) of the women reported that they had three or more risk factors for CHD. However, only 35% ($n = 157$) reported that they had been informed they were at risk of CHD. Of those who reported they had been informed of CHD risk, only 14% ($n = 66$) could name the health care provider who gave this information.

Only one risk factor, family history, emerged as significant ($p = .04$) between being told one was at risk for CHD in the presence of individual risk factors. No differences were found between these comparison groups in number of risk factors. The researchers subjected

prediction of risk factor to logistic regression analyses. Three predictive variables were significant: age (p = .03), education (p = .03), and being told by a provider of high cholesterol level (p = .05).

King et al. (2002) concluded that the perception of women and the risk for developing CHD were low. Most women did not view their co-morbidities as "risk factors" nor did they view their lifestyle behaviors as a risk in relation to CHD. For preventative treatment, women believed that to lose weight, quit smoking, and exercise would be good for them; however, they did not perceive these modifiable risk factors as contributing to CHD development.

Researchers recommended getting the potential risk for CHD introduced into conversation by the health care provider. If women could relate their perceived risk to their actual risk of CHD, it is possible this could lead women to have better control of modifiable risk factors.

The King et al. (2002) study indicated that more research was necessary to determine if increased perception of one's risk of CHD is comparable to one's actual risk of CHD, thereby providing a foundation for conduction of the current studies. The King et al. study is germane to the current study in that women's perceptions of risk for cardiovascular disease and their

knowledge of risk factor awareness were being evaluated in both studies. In King et al's. (2002) study, women were interviewed who had a prior history of CHD or symptoms suggesting CHD and were scheduled for coronary angiography. However, the current study surveyed all women over the age of 21 for CVD risk factor assessment and perceptions of risk for CVD disease with prior existence of CHD not a determining factor of the sample. The participants were evaluated on their knowledge of symptoms they consider being significant for myocardial infarction and reportable to their primary health care provider. It is hopeful that with increased knowledge and awareness of CHD risk factors and actual risk that women will utilize their personal health care provider to discuss their risk reduction strategy.

In another study, Stefanick and Wilcox (1999) examined the knowledge level and perceived risk for cancers and CVD among middle-aged and older women. Specifically, the researchers evaluated the women's perception of risk for disease in general, their personal risk, and the ability to prevent or control a disease. The researchers also investigated how demographic factors affected the women's belief and perceptions toward heart disease and cancer (breast, lung, and colon).

A convenience sample of 200 women aged 41 to 95 years old who were residing in the San Francisco area and who were recruited from local senior centers, women and senior organizations, health fairs, women's seminars, and employment settings participated in the survey. One hundred and thirty-two of the surveys were completed in person, with the rest (n = 68) returned via the mail.

Stefanick and Wilcox (1999) used a dichotomized method of data collection with medical and health variables. Significant CHD risk factors addressed in this survey included diabetes, hypertension, and obesity. Social risk factors of tobacco use, obesity, physical activity level, and family history of CHD were assessed in the medical section of the survey. Participants were asked to select a 1 (positive indicator) or 0 (negative indicator) for each of these previously mentioned risk factors.

For cancer risk assessment, women were questioned as to their previous history of breast abnormality and family history of breast cancer. Tobacco use was the sole risk factor questioned for lung cancer assessment. Risk factors of physical inactivity and history of previous breast, ovarian, and endometrial cancers were used to indicate colon cancer risk measures. Another medical section in the survey pertained to previous history of cardiovascular

disease and other cancers. An 11-point Likert scale was used for the participants to rate their current level of health from poor to excellent.

Next, the researchers addressed issues of knowledge level of mortality with the participants. Questions including leading causes of death for both men and women in various age groups were used to assess the women's knowledge for mortality. Included in the possible answers were accidents, CHD, strokes, and cancer. Participants were asked specifically for which cancer was the leading cause of death: breast, colon, and lung, cervical, or ovarian.

A 5-point Likert scale was used to evaluate participants' perception of risk for women in general for developing certain diseases: breast cancer, lung cancer, colon cancer, and CHD. Perceived personal risk was evaluated using the same scale with each of the mentioned diseases. Women were then evaluated on the perception of control and perceived preventability. Finally, general knowledge questions regarding these health care issues were rated from strongly agree to strongly disagree.

Characteristics of women who participated in the study were divided into two groups consisting of those who completed the survey in person and those who returned the surveys via mail. Age, marital status, and previous heart

attack history provided outright differences between these two groups with women who returned the surveys by mail being older $t(191) = -3.39$, $p < .001$ and single (widowed or divorced), χ^2 (1, $n = 200$) = 7.73, $p < .01$. Results corresponding with mortality knowledge showed significantly higher indications (76%) of the women were indeed knowledgeable regarding leading cause of death in men and women. In divided age groups with younger women (45 to 64 years) to older ($\geq$ 65 years), the participants were more knowledgeable than the younger target groups, $F(1, 168) = 20.48$, $p < .001$. Additionally, the men answered more questions correctly than the women, $F(1, 168) = 19.07$, $p < .001$. Researchers noted that participant age was not significant; however, younger women were more aware that the leading cause of death of women was CHD than were older women, $t(178) = 3.75$, $p < .001$.

Within the target age group of women 45 to 54 years, 64% of women in the survey correctly indicated that breast cancer was the leading cause of death. However, in other age groups it was incorrectly identified by 58% of women in target age 55 to 64 years, 44% of women 65 to 74 years, 38% of women 75 to 84 years, and 37% for women over 85 years of age. Stefanick and Wilcox (1999) also reported that women tend to view their perception of heart disease as controllable compared to the cancers listed. The

participants also chose heart disease and lung cancer as preventable, more so than breast and colon cancer. However, women's self perception of risk for developing each disease specifically was measured significantly lower than a woman's risk in general ($p < .001$).

With regard to knowledge, women were more aware of the family history role with risk of breast cancer. Also, women seemed knowledgeable regarding how effective smoking cessation was in lowering one's risk to lung cancer. However, women were lacking in evaluating actual versus perceived risk of heart disease over age 65 years old.

In examining middle-aged and older women, the researchers found that women of their age groups were lacking knowledge concerning mortality among them. The participants also tended to overestimate mortality of breast cancer when compared to lung and colon cancer. Of women aged 65 and older, 34% knew CHD was the leading cause of death in this age group.

Accurate knowledge and self-perception of risk for disease are important but not a must for lifestyle changes. This theory led the researchers to suggest a need for increased awareness for early detection strategies of disease. They postulated that with an increased self-perception of risk, there might be a shift to quicker health care decisions and behavior modifications.

Stefanick and Wilcox (1999) pointed out significant biases within a somewhat educated sample may alter outcomes in a more diversified population. However, the researchers proposed that the results of their study indicated that middle-aged and older women are often faced with important decisions regarding health care. Furthermore, many women are not informed regarding the perceived versus actual risk for certain diseases and not in a position to make an informed choice regarding health care decisions.

The researchers determined that areas of further study should be conducted, thereby lending support to conduction of the current investigation. In the current researcher's study, women's self-perception of risk for disease, specifically heart disease, was evaluated. Indicators for increased risk for CHD were also assessed including family history, tobacco use, physical activity, obesity, stressful lifestyle, and pertinent medical history. Women were asked to report their last blood pressure, cholesterol level, and, if diabetic, blood sugar levels. Additionally, participants evaluated their knowledge level of heart disease risk factors. The author compared the participants' self-perception of risk for CVD with the actual risk based on risk factor identification supplied in the survey. The author is in agreement with Stefanick and Wilcox (1999), that increased knowledge of

actual risk of women and disease may allow women to have an increased role in control of risk factors and disease prevention.

Another research study undertaken by Oliver-McNeil and Artinian (2002) sought to explore the perceptions of cardiovascular risk factors and risk-reducing behaviors among women with previously diagnosed coronary heart disease. Oliver-McNeil and Artinian (2002) sought to compare women's subjective perceptions of their risk factors with the actual risk factors recorded in their medical history. Finally, the researchers wanted to determine if a relationship existed between subjective perception of risk factors and risk-reducing behavior.

A descriptive study was conducted at a teaching hospital with a large cardiology department where 7,000 diagnostic cardiac catheterizations and percutaneous coronary revascularizations are performed each year. Lists of potential participants were generated from both the cardiology department and coronary care unit. The cardiology department provided names of patients who had been admitted with the diagnosis of "chest pain rule out myocardial infarction." The coronary care unit listed the women diagnosed with myocardial infarction as confirmed by elevated serum cardiac enzymes. Inclusion criteria for this study were women over the age of 18 years old who had

been diagnosed with coronary artery disease based on angiographic findings or elevated cardiac enzymes within the last 7 days. The participant had to be able to read and write in English and be mentally competent as evidenced by living independently in the community. Each potential participant also had no previous personal or familial experience with cardiac rehabilitation and did not have a previously documented diagnosis of myocardial infarction or percutaneous transluminal coronary angioplasty in their medical record.

Potential participants were approached in the hospital setting prior to discharge and informed of the research study. After obtainment of informed consent, the participants were instructed that questionnaires would be mailed one week after discharge from the hospital. A total of 33 questionnaires were returned out of 50 mailed to participants, which indicated at 66% response rate.

The first portion of the questionnaire consisted of demographics including age, race, marital status, educational level, menopausal status, and length of stay in the hospital. Researchers also performed a chart review of the history and physical of each participant to identify known cardiovascular disease risk factors. Participants were then assessed according to perceived risk factors, history of coronary heart disease, previous

cardiac educational classes, and if they had been previously diagnosed with heart disease by a physician.

The second portion of the questionnaire was derived from the Coronary Heart Disease Knowledge Test. Twenty questions were selected to assess knowledge of risk factors including diet, stress, exercise, smoking, and serum high density lipoprotein cholesterol. Each of the questions had one correct answer with a potential scoring from 0 to 20.

The final portion of the questionnaire used the Health-Promoting Lifestyle Profile II, which is used to measure cardiovascular risk-reducing behaviors. Fifty-two items address personal health-promoting behaviors, indicated by ranking each item on a 4-point scale assigning a frequency to each behavior with 1 = Never and 4 = Routinely. These questions assessed components of healthy lifestyle, physical activity, nutritional regimen, health responsibility, spiritual growth, stress management, and interpersonal relations. This portion of the questionnaire was scored by the summation of responses to all items.

The demographic representations of the 33 participants in this study were Caucasian women ages 36 to 85 years old (M = 65.64 years) with a mean educational level of 12.67 years (range of 8-18 years). Seventy

percent of the participants were married (n = 23), 12% divorced (n = 4), 15% widowed (n = 5), and 3% (n = 1) had never been married. Of the 33 participants, 88% (n = 28) had experienced menopause. Hospital length of stay ranged from 1 to 21 days (M = 3.56 days). Upon hospital discharge, 45% of the participants (n = 15) stated that they did not receive cardiovascular disease risk factor information during their stay or during discharge teaching.

Documentation of risk factors identified by the researchers during the chart reviews differed from the perceived risk factors that the participants chose on the questionnaire as a personal risk. According to the medical records, menopause was the most common risk factor followed by hyperlipidemia and hypertension. Of the participants surveyed, only a small number could identify personal cardiovascular risk factors. Within the personal cardiovascular risk factors listed, 33% chose family history (n = 11), 18% chose hypertension (n = 6), and 12% chose high cholesterol, diabetes, and stress (n = 4). Other risk factors identified by at least one participant included history of smoking, symptoms of angina, secondhand smoke, obesity, and age. In the 6 participants who chose hypertension as a risk factor, 2 (33%) believed that because they were on medication to control the blood

pressure that hypertension was no longer a risk. The least commonly identified personal risk factors included menopause, age, and lack of exercise.

Participants scored a range from 15% (3 correct answers) to 95% (19 correct answers) on the 22-item Coronary Heart Disease Knowledge Test. The mean score was 64% (12.75 correct answers). Twenty-four participants (73%) answered correctly questions dealing with heredity, weight loss, and relaxation techniques. Incorrect responses on the knowledge portion of the test focused on relationships between stress and atherosclerosis with 22 (67%) participants selecting the wrong answer, signs of over exertion (21 participants, 64%), and direct benefits of exercise (19 participants, 58%).

The Health-Promoting Lifestyle Profile depicted overall participants performed the following risk-reducing behaviors: stress management, nutrition, health responsibility, and physical activity. The risk-reducing behavior portion had a mean score of 2.44 with a range of 1.60 to 3.37. Even though the participants scored higher on the stress management portion of the Health-Promoting Lifestyle Profile (M = 2.65), the mean knowledge score related to stress on the Coronary Heart Disease Knowledge Test was low (67% answered incorrectly).

Oliver-McNeil and Artinian (2002) found no significant relationship between perceived risk and risk-reducing behaviors, $r = -0.055$, $p = .82$. The researchers found no significant relationship between knowledge of risk for coronary heart disease and risk-reducing behaviors, $r = -0.011$, $p = .95$. Also, the study showed no significant relationship between education and knowledge of coronary heart disease risk factors, $r = 0.05$, $p = .78$, or between education and health-promoting lifestyle, $r = 0.21$, $p = .24$.

Oliver-McNeil and Artinian (2002) suggested, from the data collected, that the female participants had limited perceptions of the personal risk of coronary heart disease. The perceived risks of the participants were significantly fewer than the actual risks documented in their medical record. The actual risks documented were those consistent with cardiovascular disease risk factors identified by the American Heart Association. No relationships were found between knowledge of coronary heart disease risk factors, educational level, age, and risk-reducing behaviors.

The Oliver-McNeil and Artinian (2002) study is relevant to the current research in that it also seeks to explore if a relationship exists between the knowledge women have of cardiovascular disease risk factors and

their perception of risk for this disease. The study conducted by Oliver-McNeil and Artinian was conducted with women who had recently been diagnosed with coronary heart disease by serum cardiac enzymes or coronary angiography. However, the current researcher conducted the survey among women without having the criteria of previously documented coronary heart disease. This researcher also sought to evaluate women's knowledge of signs and symptoms of a myocardial infarction.

Symptom presentation with acute myocardial infarction and the influences of age, sex, and risk factors was the purpose of the study conducted by Culic, Eterovic, Miric, and Silic (2002). The researchers chose to examine this presentation through an observational study conducted between January 1990 and July 1995. The sample was taken during the designated time frame from patients admitted to the hospital as the result of a first acute myocardial infarction (AMI).

Diagnosis of AMI was based on at least two of the following criteria including electrocardiograph changes suggesting an AMI, onset of identifiable pain or other symptom indicative of AMI, and an increased cardiac enzyme level that indicated myocardial injury. Patients with a previous myocardial infarction or those unable to answer the questions were excluded from the study. The study was

conducted via a structured interview and chart review form utilized by a medical student and nurses a median of 3 days post-AMI. The instrument used for data collection addressed areas of pain at particular body locations and other related signs and symptoms at onset of AMI prior to hospital admission. Pain locators identified chest, right and left arm, right and left shoulder, back, neck, epigastric, jaw, and head. Associated non-pain symptoms included diaphoresis, weakness, dyspnea, nausea, vomiting, belching, palpitations, cough, dizziness, hiccups, and tinnitus. Data taken from chart reviews of each subject included age, sex, cholesterol levels, race, presence of diabetes, hypertension, tobacco use, admitting blood pressure, heart rate, and peak cardiac enzyme level.

Statistical analysis was used to determine a predictability of various AMI symptoms or their absence using a stepwise logistic regression in terms of age, sex, risk factors, and cardiac enzyme level. Due to this analysis, symptom odd ratios for each predicative value were adjusted for confounding influences of all other variables. Analyses for atypical symptom presentation including absence of pain and presence of non-pain symptoms were calculated separately for male and female subjects.

The research study had a total of 2,123 patients admitted to the hospital during this study period with 1996 who met the inclusion criteria to be included in the study (1395 men, 601 women). The data collected indicated that the men in the study tended to be younger, smokers, and less likely to be hypertensive, diabetic, or hypercholesterolemic than women. The men in the study also had a higher diastolic blood pressure (87 ± 16) as compared to women (84 ± 16). A greater rise in peak cardiac enzyme levels also tended to be present in the men as compared to women.

In both the adjusted and unadjusted data analyses, women were more likely to present with complaints of arm, neck, jaw, back, isolated non-chest pain, or headache. Women were also more likely to report non-pain symptoms overall, specifically nausea, shortness of breath, and cough. Men generally reported chest pain, diaphoresis, belching, or hiccups on presentation to the hospital.

Isolating age as a risk factor revealed that the elderly were less likely to present with complaints of any pain but more likely to present with dyspnea or faintness. Upon reviewing presentation symptoms of tobacco users, data revealed that smokers typically had a chief complaint of any type of pain including chest pain, arm pain, neck, or non-chest pain as compared to nonsmokers. Additionally,

smokers also presented with non-pain symptoms including increased weakness, vomiting, and less likely to present with diaphoresis, dyspnea, or fatigue. Also, diabetic subjects were less likely to report pain and more likely to report non-pain symptoms specifically weakness, nausea, dyspnea, and cough as compared to non-diabetics.

Atypical symptoms including absence of pain was found more often in females than male subjects who participated in the study. The significant independent predictors of absence of pain were lower cardiac enzyme levels (p = .0003), diabetes mellitus (p = .0002), and increased age (p = .01). Male subjects had significant independent predictors of absence of pain including lower cardiac enzyme levels ($p <$ .0001), diabetes mellitus (p = .0002), increased age (p = .0001), and negative tobacco use (p = .005).

Data collection and analyses indicated that after adjustment for confounding baseline variables and enzymatic infarct size, the presence of pain in general and pain localized in the chest area was more frequently accompanied by men presenting with AMI as compared to women. Data analyses for female subjects indicated that pain was not generally present in the chest area but rather outside the chest area including arms, back, neck or jaw, and head. Non-pain symptoms, including nausea,

dyspnea, and cough, were also more increasingly demonstrated with presentation of AMI in women. Therefore, the individuals who presented with non-pain and atypical symptoms could have possibly increased the risk of AMI recognition in female patients. The researchers suggested this atypical symptomatology may have been related to delay in seeking medical treatment as compared to subjects who presented with chest pain on arrival to the hospital.

Patients diagnosed with AMI who did not describe their symptomatology as chest pain tended to arrive at the hospital an average of 2 hours later and were less likely to be recognized as AMI. These patients were also less likely to receive the thrombolytic therapy needed to minimize heart muscle damage as compared to those who present with chief complaints of chest pain. Female, ethnicity, and history of congestive heart failure and stroke are examples of subgroups that may not have presented with complaints of chest pain on arrival to the hospital. Diabetic females tended to be a larger subgroup for high risk for painless onset associated with various vague symptoms.

The researchers summarized their study as a description of the influencing baseline characteristics of AMI symptomatology. They also suggested further understanding of those associated with less typical

presentation and early identification of this clientele to strive for more effective treatment for patients with an AMI.

Therefore, the Culic et al. (2002) study laid the foundation to further investigate women's risk factors and their knowledge related to cardiovascular disease. This current research study under investigation differed from Culic et al. in that symptom presentation was not assessed in the Women's Health Survey. However, in the Women's Health Survey women were asked to distinguish symptoms that are suggestive of a heart attack. Of the symptoms listed, some were atypical in order to determine if women were able to identify those non-chest pain symptoms that may need to be further evaluated. In the current research study, the sample was not limited to diagnosis of first AMI but to adult women. However, in the survey they were asked to identify if they had experienced any previous cardiovascular disease history. This current researcher also addressed common risk factors for CVD and perceptions of risk for this disease in women, whereas Culic et al. (2002) investigated prevalence of pain at various body locations and occurrence of other symptoms associated with AMI in men and women.

A study of actual and perceived risk of chronic illnesses in rural older women was conducted by Fiandt,

Pullen, and Walker (1999). These researchers chose to explore the actual and perceived risk for six chronic illnesses: coronary heart disease, cerebrovascular disease, breast and colorectal cancer, osteoporosis, and depression. The study was further enhanced by examining the relationship between demographic characteristics of the women and the perceived and functional health status to actual risk factors and risk perception.

The questions addressed in this study included the following:

1. What is the relationship between actual and perceived risk for common chronic illnesses in older rural women?
2. How accurate are women's risk?
3. Which actual risk factors are influencing older rural women's perceived risk for these chronic illnesses?
4. What is the relationship of selected demographic factors and perceived health status to older rural women and perceived risk for chronic illnesses?

Older women aged 65 to 91 years living in a rural area of southwestern Nebraska was the location from which the sample for the study was determined. The participants were recruited from voter registration in four rural counties of southwestern Nebraska. The study was conducted

via telephone interview in which trained interviewers collected data regarding preventative health behaviors in rural older women.

Participants were questioned regarding existence of established risk factor objectives listed from the following chronic illnesses: CHD, stroke, osteoporosis, breast and colorectal cancer, and depression. Women were asked to identify risk factors in each group of illnesses that pertained to them individually. A score was given for each of the chronic illnesses listed as to the number of risk factors the participants acknowledged for each group. If the participant had been previously diagnosed with the chronic illness in question, they were given the maximum risk score possible for that group.

Coronary heart disease risk factors included hypertension, hypercholesterolemia, tobacco use, and diabetes. Additionally, physical activity level, obesity, and family history of CVD were also identified as risk factors for heart disease. Cerebrovascular risk factors identified were atrial fibrillation, history of heart disease, and advanced age (> 75 years). Osteoporosis risk factors included slender white women and assessment of estrogen use, amount of calcium intake, smoking history, alcohol use, and decreased physical activity. Breast cancer risk factors listed included advanced age, family

history, age of first pregnancy, early menarche, late menopause, obesity, benign breast disease, and history of ovarian or endometrial cancer. Family history, history of gynecological cancer, and history of ulcerative colitis or colorectal polyps were factors associated with increased risk for colorectal cancer. Risk of depression was evaluated by addressing the number of stressful life events, impaired functional status, and previous personal and family history of depression.

Participants were then questioned as to their perceived risk by rating their individual personal risk for each disease as compared to other women their age in the next 10 years. Responses were limited to high, medium, or low. Perceived health status was measured using the 20-item Medical Outcomes Study Short Form General Health Survey. In this portion of the interview, participants were evaluated according to their general health perception, mental health, physical functioning, role functioning, and social functioning.

All subjects were Caucasian women with ages ranging from 65 to 90 years (M = 74, SD = 5.99) reflective of the demographic characteristics associated with increased risk in rural older women. Educationally, 46.1% had completed high school and 43.1% had received some formal post-high school education. Of the participants, 14% classified

their personal health as very good, 24.5% good, 39.2% fair, and 20.6% reported poor health.

In the findings, actual risk scores were listed as high, medium, or low for each of the six chronic illnesses. Those illnesses at high risk for this sample ranged from 27.8% with coronary heart disease (n = 28) to stroke and depression each with 10.8% (n = 10). In the category of perceived risk, 23.5% of the women questioned saw themselves at high risk for osteoporosis (n = 24) in comparison to 7.8% (n = 8) who classified themselves as high risk for coronary heart disease and 5.9% (n = 6) for breast cancer.

With comparison for actual and perceived risk for coronary heart disease, 36% accurately perceived themselves at risk and 51% underrated their risk with 13% overrating their risk. Participants who were at risk for stroke (48%) overrated their personal risk (28%), and 24% underrated their risk. Breast cancer comparisons indicated that 63% underrated their risk, 5% overrated their risk, and 32% of the participants were accurate in their risk estimate for this disease. In the depression assessment category, 57% accurately identified themselves at risk, 16% overrated, and 27% underrated themselves at risk for this illness. Osteoporosis was accurately identified by 40% of the participants who were assessed to be at risk

for this disease, with 15% overrating and 45% underrating their risk. The participants correctly assessed themselves at risk for colorectal cancer 50% of the time, 31% overrated, and 19% underrated their personal risk.

The researchers attempted to identify which actual risk factors might influence perceived risk. Familial history was clearly identified as an influencing factor for risk perception in both breast and colorectal cancer. Individuals with previous history of ulcerative colitis and or polyps also associated this with increased risk of colorectal cancer. Personal history of hypertension was associated with increased risk of stroke. A negative correlation between level of education and perceived risk for colorectal cancer was the only significant relationship between demographic factors and perceived risk. Except for breast cancer, the participant's general perception of health was related to lower perceived risk for all chronic illnesses.

The Fiandt et al. (1999) research is germane to the current research in that both studies investigated women's perceptions of risk for CVD. Fiandt et al. suggested the older rural women tended to underestimate their risks for chronic illnesses that were a significant threat to their status both in health and functional ability. The current researcher evaluated the perception of risk in two ways.

First, women were asked to choose one of the listed illnesses as their biggest health risk. Secondly, women were asked to individually rank their risk with a rating of very likely, somewhat likely, or not likely for each of the listed illnesses. The author is in agreement with Fiandt et al. that women may not have an accurate perception of risk for the diseases responsible for the majority of their disabilities and premature death. The author also agrees with the previous researchers that women may not use known risk factor criteria as an influencing factor for increased perception of risk.

The final literature review in this chapter focuses on information received by women on heart attacks and how this information affects the knowledge, beliefs, and intentions to act in a cardiac emergency. Meishke (2001) investigated information received by women on acute myocardial infarctions, how women evaluated this knowledge, and how this acquired information related to women's knowledge of AMI, personal risk perceptions, and intentions to act in a cardiac emergency.

Data were collected via telephone interviews in Seattle, Washington, in 1997. Potential candidates for this study had been previous participants in the Community Trial of Mammography Promotion survey conducted in 1994 and had agreed to participate in further research. In 1997

the participants were notified and preliminary interviews conducted to determine a population for this impending study on women and heart attacks. Of the 1137 participants who had previously agreed to participation in future research surveys, 844 women over 50 years of age were included in the sample.

The instrument for this research addressed eight categories: demographics, information acquisition (total number of information sources and specific content and evaluation), knowledge of heart attack symptoms and heart attacks, personal risk perceptions, risk factor assessment, and personal coping skills in response to heart emergencies. Demographic questions included age, educational level, and marital status. Information acquisition was evaluated by having the participant indicate if information had been received in the past year from a health care provider, friends and family, mass media (newspaper, radio, or television), and magazines. Specific content evaluation was further enhanced by asking participants if a health care provider had previously discussed such topics as heart attack prevention, heart attack signs and symptoms, steps to take if experiencing these symptoms, and personal risk factor assessment of the participant for having a heart attack. Participants were asked to list or identify signs and symptoms of a heart

attack. Their responses were placed into categories according to symptom classification. The participants' personal knowledge of heart attack information was determined by having them answer four close-ended questions pertaining to myocardial infarction pathophysiology, mortality, and presentation of symptoms. To assess coping during cardiac emergencies, two questions asked participants to agree or disagree with calling 911 and getting to the hospital quickly if they were experiencing a heart attack scenario. Women were asked to identify personal perception of risk for heart attack and compare their risk to other women in the same age group. Risk factor assessment listed family history of heart attacks and previous personal diagnosis of myocardial infarction.

The mean age of this sample was 65 years. Of the women included in this study, 53% reported an immediate family member with a history of AMI, and 6% reported previous diagnosis of a heart attack. Educationally, 48% of the women reported a high-school education or less, 34% with a post high-school training, and 18% with a college degree or higher.

In looking at the data of information acquisition, mass media channels were the most frequently cited source by the participants (73.6%) as having obtained heart

attack information. Mass media was also reported overall by 84% of the sample as providing information on heart attack prevention. Health care providers were reported in 53% of the responses as providing information on prevention of heart attack. Mass media was also chosen more frequently than either health care providers or family and friends in evaluation of information content: signs and symptoms of AMI, coping with AMI symptoms, and personal risk for AMI.

Health care information provided by health care providers was perceived to be more believable and more useful than that provided by mass media or family and friends. Health care providers also seemed to provide more clearer, useful, and impressionable information regarding AMI than either mass media or family and friends. Major symptoms of an AMI were identified by 83% of the respondents. In regard to personal risk of having a heart attack, 72% of the women felt they were somewhat or very likely to have an AMI during their life time, in contrast to 36% who reported that they were less likely to have an AMI than other women their age. Significantly, 90% of the women indicated they would act quickly and appropriately in response to symptoms of a heart attack.

In data collected regarding the general knowledge portion of the survey pertaining to heart attacks, the

majority answered these questions correctly. Women who had previously reported acquired information from multiple sources had an increased knowledge of AMI symptoms, general AMI issues, and greater personal risk perceptions than women who had reported few information sources.

This study conducted by the current researcher is comparable to the study of Meischke (2001) in that women's knowledge of heart attack symptoms, personal risk factor assessment, and perception of risk were evaluated. In both studies, the researchers assessed which sources provided to women were responsible for their increased knowledge of risk for cardiovascular disease. Meischke (2001) took this further and evaluated the information received by the participants as to the believability, clearness, and impressionability. However, this current author's research addressed risk factor assessment, not limited to personal history or family history of AMI, including both modifiable and non-modifiable risk factors.

In this review of literature, research has been presented which investigated women and cardiovascular disease. In the mentioned studies, perception of risk for not only CVD but also other health care issues for women have been reviewed. Research describing perception of risk, risk factor awareness, and risk reducing behaviors were included which suggested that more studies were

needed to further evaluate this phenomenon. Additionally, it was suggested that more research was needed to determine if there is a relationship between risk factor awareness and risk-reducing behaviors. In the literature review AMI, symptom presentation, general knowledge of AMI issues, and differences in men and women, specifically typical versus atypical symptomatology, have been discussed. In several of the studies, participants were women with known history of CVD. However, in other studies reviewed, participants were excluded if a known history of CVD was cited.

The research presented gives more evidence that women with cardiovascular disease is a complex subgroup of this disease progression. The literature review furthermore supported the current author's study in that various criteria were addressed with women and cardiovascular disease including the role of the health care provider in these phenomena.

Chapter III

The Method

The purpose of this study was to evaluate women's knowledge of cardiovascular disease risk factors and assess their perception of risk for this disease. Included in this chapter are research design, setting, population, and sample. In addition, the instrument and procedures used to collect the data are discussed. Lastly, data analysis methods are identified.

Design of the Study

A descriptive design was used for this study. Descriptive research is defined as seeking to explore and document the observation of phenomena in natural settings (Gillis & Jackson, 2002). Nieswinadomy (1998) defines descriptive research with "phenomena as described or the relationship between variables is examined" (p. 127). The aim of this descriptive study was to explore the knowledge level of cardiovascular disease risk factors and perception of risk for cardiovascular disease in women. This design was appropriate to explore phenomena of women

and cardiovascular disease risk factors, their perception of risk of CVD, and their knowledge of symptoms regarding myocardial infarction.

Limitations

A limitation for this study was that self-reported information was utilized. However, many research studies have utilized this particular reporting style and found information reliable well above accepted parameters. Another potential limitation may have been that the researcher-developed questionnaire was without known reliability or validity. However, a committee of experts reviewed this research and approved the use of the researcher-developed questionnaire for this study. Therefore, this instrument has face validity within the confines of this study. A potential limitation also exists due to the small sample size and limited setting utilized in this study.

Setting, Population, and Sample

The setting for this study was local industries in a community of approximately 20,000 people from a selected southeastern state. The sample was one of convenience and consisted of adult females who work at selected industrial sites. A target sample of 50 subjects who met the criteria and offered written consent to participate in the survey

was used. The criteria included females over the age of 21 years who were employed at selected industrial sites and approached the health-awareness booth that was displayed.

Instrumentation

The Women's Health Survey (see Appendix A) was researcher-developed and was not used prior to this study. The researcher adapted a small portion from King et al. (2002) and Stefanick and Wilcox (1999) surveys, which pertained to the perception of risk used in the Women's Health Survey. The risk factor assessment portion of this survey was adapted from the American Heart Association, which published studies on modifiable and non-modifiable risk factors for cardiovascular disease.

The Women's Health Survey was the questionnaire used for this study. The questionnaire consisted of 20 questions related to demographic issues, perceived health status and health risk of the individual, perception and diagnosis of risk related to the varied diseases listed, and knowledge of heart attack symptoms. Risk factor assessment was also addressed in this study including tobacco use, obesity, cholesterol levels, familial history, sedentary lifestyle, and the amount of daily stress as documented by the participant. The questionnaire consisted predominantly of multiple-choice questions, with

some fill-in-the-blank questions, which required the participant to write a numerical measurement. Participants were able to complete the survey in approximately 15 minutes.

Questions 1, 2, 3, and 4 were demographic questions regarding age, race, marital status, and highest educational level completed. The portion pertaining to perception of risk (Questions 5, 6, and 8) identified how the individual perceived her own health status, along with asking the participant to specify the perceived risk of various diseases including cancer, heart disease, diabetes, HIV/AIDS, and osteoporosis. Risk factor assessment was evaluated in Questions 7 and 9 through 19 addressing known risk factors, such as tobacco use, activity level, diet, height and weight, family medical history, cholesterol and blood sugar levels, personal health history, daily stress level, and their menopausal status. Lastly, Question 20 asked the participant if they were knowledgeable of signs and symptoms of a heart attack. This was done on the survey by listing various symptoms for the participant to choose those which pertained to an impending heart attack.

Data Collection Procedure

Prior to implementation of this study, permission was obtained from Mississippi University for Women's Committee on Use of Human Subjects in Experimentation (see Appendix B). After permission was obtained, the researcher contacted the personnel director at each of the industrial sites selected. The researcher obtained verbal consent in order to make arrangements to set up a health-awareness booth at the local industries and conduct a survey of the women employed who consented to participate. The researcher and personnel director met, and plans were discussed as to where the booth would be located, date and time of data collection, methods of data collection, and health tips, recipes, and foods that would be provided by the researcher as incentives for the participants. The researcher obtained written permission from the personnel directors at the selected industrial sites as to the specifics of the health-awareness booth and survey (see Appendix C).

The data collection was conducted in one day at each selected industrial site. Data were collected at the three industrial sites over 3 days during a 2-week period. Data collection booths were set up at times of convenience to coincide with lunch and afternoon break. During these previously approved time periods, subjects were recruited

via the health-awareness booth. Individuals who agreed to participate signed a written consent (see Appendix D). The questionnaire and a writing instrument were provided to the participants who were then instructed not to sign their name on the questionnaire. The participants were instructed on how to complete the questionnaire and were allowed enough time to select their answers. The researcher collected the questionnaires after completion, and they were placed in an unmarked envelope, which was kept in the control of the researcher at all times. The completed surveys were kept under lock and key at the end of the data collection.

Upon the return of the survey to the researcher, health tips regarding recipes and food choices were provided along with a food sample tray consisting of fresh fruits, yogurt, and low-fat dessert bars. These foods were donated by the local hospital in observance of National Health Food Awareness Month. The researcher provided literature for the participants from the American Heart Association and answered questions regarding cardiovascular disease.

Data Analysis

The demographic and questionnaire data were analyzed using descriptive statistics consisting of central

tendency, which included mode, median, and mean. An item-by-item analysis was used for demographics and risk perceptions. Additionally, questions related to risk factors were analyzed using measures of central tendency. Responses to the risk perception questions and the risk factors were sorted according to rank order. The question concerning knowledge about signs and symptoms of heart attack was also analyzed using measures of central tendency. A predetermined score of 80% on the knowledge question indicated that the individual was knowledgeable regarding signs and symptoms of an impending heart attack.

Summary

The purpose of this study was to evaluate knowledge of women and cardiovascular disease risk factors, their risk perception for this disease, and participants' knowledge of heart attack symptoms. In this chapter, the methodology used in this study was described and discussed.

Chapter IV

The Findings

The purpose of this study was to evaluate knowledge of women and cardiovascular disease risk factors and assess their perception of risk for this disease. This study was guided by a non-experimental, descriptive design used to explore the phenomena of women and cardiovascular disease (CVD) risk factors, their perception of risk for this disease, and their knowledge of symptoms regarding myocardial infarction using a self-report questionnaire.

Description of the Sample

Convenience sampling was utilized to collect data from adult women employed in selected industrial sites in a rural town in northeast Mississippi. The participants were women who approached the health awareness booth and consented to answer the Women's Health Survey.

Fifty-nine women consented to participate in the Women's Health Survey. The ages range from 23 to 66 years with a mean of 42.3 years and standard deviation of 9.96 years.

Marital status was reported as either single, married, divorced, or widowed. Seventy-seven per cent of the women were married (n = 46), 6.2% single (n = 4), 10% divorced (n = 5), and 6.1% widowed (n = 3).

Most of the participants had received some form of college education (n = 44). Approximately 39% had graduated from high school or obtained a GED certificate. Of those who attended college, 22% had attended graduate school and received graduate degrees (n = 22). The demographic characteristics are presented in Table 1.

Table 1

Demographic Characteristics of the Sample Expressed in Frequency and Percentage

Variable	f[a]	%
Race		
Caucasian	53	90.0
African American	6	10.0
Marital status		
Single	4	6.2
Married	46	77.0
Divorced	5	10.0
Widowed	3	6.1
Education		
No GED/diploma	1	1.6
GED/diploma	23	38.9
College classes	11	18.6
College degree	11	18.6
Graduate degree	22	22.0

Note. Percentages were rounded to the nearest 10th.
[a]N = 59.

Results of Data Analysis

Research Question 1: What is the perception of women regarding cardiovascular disease?

Perceived Health Status

In Questions 5, 6, and 8 on the Women's Health Survey addressed the perceived health status and perception of risk of the participants. Of the 59 participants, 45% described their health status as good. Options for this question included very good (25%, *n* = 15), good (45%, *n* = 27), average (28%, *n* = 17), and poor, which was not chosen by any of the participants (see Table 2).

Table 2

Perceived Health Status of Participants Expressed in Frequency and Percentage

Perceived health status	*f*[a]	%
Very good	15	25.0
Good	27	45.0
Average	17	28.0
Poor	0	0.0

Note. Percentages were rounded to the nearest 10th.

[a]*N* = 59.

Perception of Risk for Illnesses

In the Women's Health Survey, participants were asked to select only one from a specific list of illnesses that they perceived as their biggest health care risk. The greatest threat perceived by this sample was heart disease followed by breast cancer. See Table 3 for the responses related to disease risk perception.

Table 3

Participants' Perception of Risk for Listed Illnesses Expressed in Frequency and Percentage

Health risk	*f*[a]	%
HIV/AIDS	0	0.0
Breast cancer	12	20.3
Heart disease	20	33.0
Infectious disease	1	1.6
Diabetes	9	15.0
Hypertension	9	15.0
Ovarian/cervical cancer	5	8.0
Osteoporosis	3	6.1

Note. Percentages were rounded to the nearest 10th.

[a]*N* = 59.

Perception of Risk for Specific Illnesses

Along with the participants choosing their biggest perceived health risk, they were also asked to rank each of the listed illnesses as to how likely they perceived their risk for each one. The women could chose between not likely, somewhat likely, or very likely as their response. The greatest number of women (*n* = 11, 18%) participating in this study believed that it was very likely that they were at risk for heart disease, followed closely by 10 women (16.7%) who indicated they believed they were at high risk for hypertension. Breast cancer was listed as being somewhat likely by the greatest number of women (*n* = 39, 66%) followed by heart disease for 34 (58%) of the women. A majority of the participants (59%) indicated that they were not likely to be affected by HIV and AIDS as opposed to only 12% who related they were not likely to be affected by heart disease. Table 4 presents the findings relevant to the likelihood of risks for each specific disease.

Table 4

Perception of Risk for Each Listed Illness on the Women's Health Survey Expressed in Frequency and Percentage

	Very likely		Somewhat likely		Not likely	
Illness	*f*	%	*f*	%	*f*	%
HIV/AIDS	0	0.0	0	0.0	59	100.0
Breast cancer	3	5.1	39	66.0	14	27.9
Heart disease	11	18.0	34	58.0	12	20.0
Infectious disease	0	0.0	9	15.0	46	77.0
Diabetes	7	11.3	25	42.0	27	46.7
Hypertension	10	16.7	18	31.0	28	47.3
Ovarian/ cervical cancer	4	6.7	22	37.0	30	51.3
Osteoporosis	7	12.2	27	46.0	22	37.8

Note. $N = 59$. Percentages were rounded to the nearest 10^{th}.

Risk Awareness of Disease Development

In the risk awareness portion of the Women's Health Survey, participants were asked if they had been informed that they were at risk for developing any of the listed illnesses. None of the women reported they had been informed that they were at risk for contracting HIV/AIDS

or an infectious disease. Twenty-five percent of the respondents had been informed they were at risk for heart disease and diabetes mellitus (n = 15 each). Twenty-four percent (n = 14) of the participants had been advised they were at risk for hypertension, 19% (n = 11) for breast cancer, 12% (n = 7) osteoporosis, and 11% (n = 6) for ovarian or cervical cancer.

Research Question #2: What are the risk factors for cardiovascular disease in women?

Family History

The Women's Health Survey asked the participants to identify both their personal and family medical history for diagnosis of certain diseases. Family history options included cancer, heart disease, diabetes, and hypertension. Participants were asked to identify immediate blood relatives who had the listed diseases. Table 5 lists the results of this portion of the questionnaire.

Table 5

Family Medical History Identified on the Women's Health Survey Expressed in Frequency and Percentage

Family medical history	*f*[a]	%
Cancer	23	38.0
Heart disease	20	33.0
Diabetes	17	28.0
Hypertension	20	33.0

Note. Percentages were rounded to the nearest 10th place.
[a]*N* = 59.

Risk Factor Assessment

The risk factor assessment portion of the survey identified modifiable risk factors that contribute to chronic disease and illnesses. The risk factors in question on the Women's Health Survey included tobacco use, activity level, height and weight, known cholesterol level, blood sugar levels, and blood pressure readings. Also, the participants were questioned regarding menopausal status, stress level, and previous diagnosis of anxiety and depression.

Tobacco use. Eight participants (13.5%) identified themselves as smokers. The number of years smoked ranged from 3 to 27 years, with a mean of 17.5 years and mode of

15 years. These respondents specified the number of cigarettes per day smoked as a one-half pack per day. Also, 5 participants (n = 8) identified themselves as previous smokers. The average number of years smoked for these participants was 8.2 years with an average of one to two packs per day.

Diabetes mellitus. Four of the respondents (6.7%) had been diagnosed with diabetes mellitus. Of the 4 diabetics, 3 stated that their average blood sugar ranged from 110 to 149 mg/dl. One diabetic could not identify her average blood sugar reading.

Cholesterol level. Of the 59 participants in the Women's Health Survey, only 23.7% (n = 14) responded that they were aware of their cholesterol level. Five of the 14 (35%) identified their cholesterol levels as less than 200 mg/dl. The remaining 9 respondents who knew their cholesterol levels averaged 231 mg/dl, with a range from 201-260 mg/dl.

Activity level, height, weight, and blood pressure readings. Fifty-two percent (n = 31) of the participants indicated that they participated in physical exercise activities for at least 30 minutes a session. The majority of these respondents (17%, n = 5) stated that they exercised at least 5 days a week.

The participants were asked to list their height and weight. The Basic Metabolic Index (BMI) was calculated from these measurements. Fifty-six participants listed their height and weight on the survey. The average BMI calculated from the respondents was 28, which indicated the group as a whole was considered overweight. The range of individual BMI scores was 21 to 40.

Fifty percent (n = 30) of the participants could recall their last blood pressure reading. Of those who could recall the last reading, all listed the reading as less than 140/80 mmHg.

Menopausal status. Fifty-four percent (n = 32) of the women indicated that they still had a menstrual cycle. Twenty-eight percent (n = 17) of the participants indicated they had experienced menopause. Nine participants did not answer this question on the survey.

Stress and anxiety. Ten respondents (17%) identified themselves as having a diagnosis of anxiety and or depression. Thirty-six respondents (61%) indicated that they found themselves frequently irritable, stressed, or in a hurry.

Research Question #3: Are women knowledgeable about signs and symptoms of a myocardial infarction?

Knowledge of Heart Attack Signs and Symptoms

Participants were asked questions related to signs and symptoms of a heart attack to determine their knowledge level concerning this health event. The sample was considered knowledgeable if they scored at least 80% each on the knowledge portion of the exam. Additionally, for the purpose of this study, at least 80% of the sample as a whole had to score 80% on survey for this sample to be considered knowledgeable. Of the 59 participants, 58 (99%) filled out the knowledge portion of the questionnaire. Thirty-six participants (62%) failed the knowledge portion of the questionnaire. Twenty-two participants scored above 80% on the knowledge portion on the exam on signs and symptoms related to heart attack. Since only 22 participants (38%) scored 80% or higher on the knowledge portion of the women's Health Survey, this sample of women was deemed not knowledgeable of the signs and symptoms of a myocardial infarction.

The knowledge portion of the Women's Health Survey asked participants if they were knowledgeable regarding signs and symptoms of a heart attack. Seventy-six per cent (n = 45) identified themselves as knowledgeable of signs and symptoms regarding a heart attack. However, when the

questions were analyzed item by item for correct responses, less than half correctly identified neck or jaw pain, abdominal pain, or a sensation of impending doom as a sign of a heart attack. Chest pain was chosen most frequently (*n* = 56, 94.9%) by the participants as a sign of a heart attack. Blurred vision (*n* = 25, 42.3%) was the most chosen incorrect answer on the survey. Abdominal pain and panic sensation and impending doom was a correct answer chosen. Table 6 lists the findings in rank order of frequency and percentage for the knowledge portion of the Women's Health Survey by only 23.7% (*n = 14).*

Table 6

Heart Attack Signs and Symptoms by Rank Order Expressed in Frequency and Percentage

Signs and symptoms of myocardial infection	*f*[a]	%
*Chest pain/discomfort	56	94.9
*Shortness of breath	53	89.8
*Dizziness/weakness	50	84.7
*Arm or shoulder pain	44	74.5
*Nausea/vomiting	42	71.1

(*table continues*)

Table 6 (*continued*)

Signs and symptoms of myocardial infection	*f*[a]	%
*Pounding or irregular heart rate	42	71.1
*Sweating for no apparent reason	37	62.7
*Neck or jaw pain	27	45.0
Blurred vision	25	42.3
*Abdominal pain	14	23.7
*Panic sensation/impending doom	14	23.7
Ringing in the ears	14	23.7
Joint pain	8	13.5
Diarrhea	5	8.4
Difficulty voiding (urinating)	3	5.0
Constipation	3	5.0
Fever	1	1.6

Note. Percentages were rounded to the nearest 10th.

*Indicates correct answers to knowledge question.

Additional Findings

In the Women's Health Survey, participants were asked to identify who had informed them of their risk for developing listed illnesses. Responses included family physician, obstetrician or gynecologist, nurse practitioner, health fair screenings, other specialist, or

media sources (internet, magazines, television commercials). The majority of the participants identified medical doctors as the source for informing them of their risk for these illnesses specified with 37% (n = 22). Obstetricians or gynecologists were second most frequently identified source of information with 18% (n = 11) keeping their patients informed of potential risk awareness. Three participants (5.0%) identified learning of their risk through media sources, such as Internet, television commercials, and magazine articles. Only 1 (2%) respondent chose nurse practitioners as the source for informing them of their risk for developing certain diseases. Lastly, 2% (n = 1 each) identified health fair screenings and other specialist as the information source for risk of disease development.

Another additional finding included the participant's responses to a personal health history in an effort to ascertain if the participants had been diagnosed with certain diseases. Personal medical history regarded diagnosis of heart attack, coronary artery bypass graft surgery (CABG), percutaneous transluminal coronary angioplasty (PTCA), congestive heart failure, angina, irregular heart rate, hypertension, diabetes, breast cancer, lung cancer, and ovarian and cervical cancer.

Table 7 presents the findings from this portion of the survey.

Table 7

Personal Health History of Participants on the Women's Health Survey Expressed in Frequency and Percentage

Medical problem	*f*[a]	%
Heart attack	1	2.1
CABG	0	0.0
PTCA	0	0.0
Congestive heart failure	0	0.0
Angina	2	5.0
Irregular heart rate	10	17.0
Hypertension	9	15.0
Diabetes	4	6.7
Breast cancer	0	0.0
Lung cancer	0	0.0
Ovarian/cervical cancer	4	7.0

Note. Percentages were rounded to the nearest 10th.

[a]*N* = 59.

Summary

The purpose of this study was to evaluate women's knowledge and perception of risk of cardiovascular disease

risk factors. Demographic findings of the 59 participants in the Women's Health Survey have been presented. Also, findings for perception of risk, risk factor awareness, and knowledge of heart attack signs and symptoms have also been presented. Data analysis using measures of central tendency with frequencies and percentages was used in this study. Discussion of the findings will be presented in Chapter V.

Chapter V

The Outcomes

Cardiovascular disease is a significant health care issue for women. In recent years, women have accounted for almost half of the deaths caused by heart attacks. Cardiovascular disease has become recognized as a disease process that presents with different symptomatology in women as compared to men. Yet, women infrequently cite heart disease as a significant health care risk.

The purpose of this study was to evaluate the presence of cardiovascular disease risk factors in women, perception of risk for this disease, and determine if women were knowledgeable of heart attack signs and symptoms. A non-experimental descriptive design was used to conduct this study. Pender's (1987) Health Promotion Model provided the theoretical framework to guide this study. This study utilized Pender's theory that individuals are motivated toward health promotion behaviors by several factors including perceived health status and perceived control of health. Modifiable lifestyle behaviors play a role in behavior outcomes. In

order for a health promotion behavior to occur, the individual's perception of health or risk must be changed due to an increased awareness or knowledge gained which would have altered their view of their personal health status.

Summary and Discussion of Findings

The final sample for this study consisted of 59 adult females between the ages of 23 and 66 years who consented to participate and completed the questionnaire. Mean age of participants was 42.3 years. The sample consisted of 90% Caucasian and 10% African-American females. The majority of the sample had post-high school education (58%) with 22% having obtained a graduate degree.

Question #1: Perception of risk regarding cardiovascular disease.

Out of 59 participants, 45% described their health status as good. The participants chose heart disease overall (n = 20, 33%) as their biggest health risk, followed by breast cancer (n = 12, 20%). When asked to address and rank each of the listed illnesses independently, heart disease was chosen very likely (18%), somewhat likely (38%), and not likely (20%). However, breast cancer was chosen by 66% of the participants with a somewhat likely risk. The sample's perception of risk of

these diseases is somewhat comparable to those found in studies conducted by Fiandt et al. (1999). However, in this study breast cancer was chosen overall as biggest health risk at 66% and heart disease at 58%. Also, Meishke (2001) had similar outcomes with a higher frequency with 72% of the participants of that study felt somewhat likely they would suffer a heart attack in their lifetime.

The sample in the current study overall described their health status as good. This could be due to the fact that this sample is still somewhat in their prime and have not developed chronic disease processes. Other reasons for the overall good health described by participants was they were not avid smokers, most stated that they participated in exercise programs, and all of these women were employed full-time. Participants in the Women's Health Survey were also highly educated women with almost a fourth having obtained a graduate degree. One could theorize that these women might be more knowledgeable about their health and health-promoting behaviors.

The risk awareness findings revealed that 25% (n = 15) of the participants had been informed they were at risk for developing cardiovascular disease and diabetes mellitus. Twenty-four percent had been informed they were at risk for hypertension. Most of the participants cited their risk awareness information had been provided through

medical physicians 37% of the time. Five percent cited mass media as the source they had found out about their risk of these diseases. These are similar results obtained in the King et al. (2002) study, which 35% of the participants reported they were at risk of developing cardiovascular disease and 14% could identify the health care provider who had informed them. However, this is in contrast to the findings of Meishke (2001) where 73.6% of the sample reported mass media as the channels through which information was obtained. However, in the study conducted by Meishke (2001) health care providers were perceived to be the most believable information/data provided to the participants as compared to mass media or family/friends. Interestingly, Stefanik and Wilcox (1999) concluded that the women's self-perception of risk for developing cardiovascular disease specifically was measured significantly lower than a woman's risk in general.

As stated earlier, the sample of women who participated in the Women's Health Survey believed their health to be good, were overall not smokers, participated in exercise programs, and were employed full-time. Therefore, the women may not visit health care providers unless for an acute illness or injury. The source in which the women were informed of their risk for cardiovascular

disease, diabetes mellitus, and hypertension was reported as being through physicians. Health prevention and disease promotion interventions are not as encouraged in this area and there are areas of improvement. These full-time employed women have insurance coverage for themselves and access to health care coverage for their families. The reason nurse practitioners may not have been chosen could be explained by the health care insurance and their ability to choose physicians for their primary care. Few of the family physicians in this area have nurse practitioners in their practice. Most of the nurse practitioners in this community work with specialties, such as cardiology, gastroenterology, hematology/oncology, and pediatrics. The nurse practitioner role was developed to provide health care to under-served populations. The women in this sample would not be considered under-served with their employment status and higher educational level.

Question #2: Risk factor assessment.

In review of this sample, the most frequently identified risk factor for cardiovascular disease was family history with 33% indicating they had a positive family history for CVD. In the study conducted by King et al. (2002), this too was the only risk factor which emerged as significant (p = .04). However, in the study conducted by King et al., only women with a diagnosis of

coronary heart disease were studied as compared to this study which previous history of CVD was not a determining factor for inclusion. Cardiovascular disease is a prominent diagnosis in the South. Due to increased rates of obesity, diabetes mellitus, tobacco use, cholesterol and high-fat diets, and hypertension, which are common in the South, cardiovascular disease is a disease process found in the majority of the families living in this area of rural Mississippi.

Menopausal status was the next significant risk factor for cardiovascular disease identified by this sample. Twenty-eight percent of the sample indicated they had experienced menopause. These findings are similar to those revealed in Oliver-McNeil and Artinian (2002) which found menopause, hyperlipidemia, and hypertension as the top actual risk factors identified in their sample. However, again in the study conducted by Oliver-McNeil and Artinian (2002), women included in the study had a pre-determined diagnosis of coronary heart disease, which was not relevant for the current study conducted by the researcher.

Being overweight was another strongly indicated actual risk factor identified by the participants. The average Basic Metabolic Index (BMI) for the group was 28. This is somewhat surprising since 52% of the sample

indicated that they participated in physical exercise for at least 30 minutes a session. The majority (17%) of these women stated they exercised at least 5 days a week. In the study conducted by King et al. (2002) 66.2% of the sample had an actual risk for obesity, and 50% indicated they did not participate in any form of exercise program.

Thirty-six percent of the women described themselves as frequently irritable, stressed, or in a hurry. In the review of literature, this was not a determining risk factor identified by the samples in the studies undertaken. This increased stress levels describe by the sample could be due to several factors including work, financial difficulties, and caregivers of both children and parents. The average age of the female participant for this sample was 42 years. All of the women participating in this survey are employed full-time and the majority (76%) are married. The typical duties for women at this age other than full-time employment include parenting, being a homemaker and wife, and possibly having to take care of their own parents whose health may be deteriorating as well. Furthermore, the women who described themselves as frequently irritable and stressed may have many other stressors present in their life than women of different age groups.

Hypertension, hypercholesterolemia, and diabetes mellitus were not strongly indicated by this sample as actual risk factors for CVD. Fifteen percent of the sample had been previously diagnosed with hypertension. Of those diagnosed with hypertension, 50% could give their last blood pressure reading and those who did answer this question the blood pressure was indicated as normal. Only 23.7% of the sample were aware of the cholesterol numbers. Of this portion (n = 14) who identified their cholesterol readings, 65% (n = 9) indicated their numbers were greater than 200 mg/dl. These findings co-relate with the results of a study conducted by Oliver-McNeil and Artinian (2002) which listed these in the top three actual risk factors identified in the women who had a definite diagnosis of cardiovascular disease. However, only 6.7% (n = 4) of the sample had a diagnosis of diabetes mellitus. The questionnaire did not specify to indicate if the diabetes was insulin dependent or non-insulin dependent. Of those who were diabetic, 3 responded their average blood sugar level ranged from 110-149 mg/dl.

Surprisingly, tobacco use was one of the least indicated actual risk factors for this group of 59 female participants. Only 13.5% identified themselves as smokers, and another 8.0% identified themselves as previous smokers. This finding leads the current researcher to

question if the advent of smoke-free environments in the workplace could somehow be discouraging people from smoking. Also, it could be theorized that through media and strong encouragement of health care providers that the population could be starting to choose to quit smoking. However, it could also be due to the rising cost of tobacco products that people are just not willing or cannot afford to purchase these products as easily as in the past. Tobacco use was expected to be a more significant risk factor by the researcher when conducting this study at local industrial sites.

Question #3: Knowledge level regarding signs and symptoms of a heart attack.

In deciding if women were knowledgeable about signs and symptoms of a heart attack, it was predetermined that 80% of the sample had to score at least 80% on the knowledge portion of the questionnaire. This study revealed the overall sample was not knowledgeable about heart attack signs and symptoms, since only 38% (n = 22) scored 80% or higher. However, 76% identified themselves as knowledgeable of signs and symptoms regarding a heart attack. This deficit in actual versus perceived knowledge could be because health care providers do not educate the female clientele on the typical and atypical symptomatology of heart attacks. This lack of knowledge

may also be due to incorrect information received by females from other sources, including family, friends, and media sources, which stress typical chest pain symptoms.

From the listed symptoms on the Women's Health Survey, chest pain was chosen most frequently by the sample as a heart attack sign and symptom (94.9%). The most frequently chosen correct responses for this portion of the survey included chest pain (94.9%), shortness of breath (89.8%), and dizziness/weakness (84.7%). An explanation for these correctly chosen responses could be that most people relate chest pain and difficulty breathing with heart attack possibly from what they hear and see from family, television, reading, and radio advertisements. Internet availability is also a source of information that many people use to provide not only educational material but also advertisements.

The least identified symptoms not indicative of a heart attack were fever (1.6%), constipation (5.0%), and difficulty voiding (5.0%). Most of the sample was correct in not choosing these as symptoms present during a heart attack. Blurred vision was chosen incorrectly by 42.3% of the sample as a symptom for a heart attack. This could be due to the population getting signs and symptoms for heart attack and stroke confused.

Correct symptoms that were frequently missed by the sample included neck/jaw pain (45%), abdominal pain/discomfort (23.7%), and panic sensation/impending doom (23.7%). These signs and symptoms that were not correctly identified by the sample are atypical presentations of a heart attack. This inability of the sample to recognize atypical symptomatology of heart attack were supported by the study undertaken by Culic et al. (2002) which indicated that women having a heart attack were more likely to present with atypical symptoms when compared to men. Atypical symptoms including absence of pain were more often found in females especially in diabetic females who tended to be a larger subgroup for high risk painless onset associated with vague various symptoms (Culic et al., 2002). Additionally, these atypical symptoms are not broadly disseminated by the media as possible signs of a heart attack.

Limitations

1. Wording of the questionnaire could have not been clearly understood by the participants. Two returned surveys were not answered correctly as depicted in the instructions on certain questions. Although all participants had completed a high school education, the questionnaire may have been

difficult to understand in order to respond to certain questions.

2. The sample for this study was 90% Caucasian and 10% African-American. However, the sample demographics are not consistent with the population in this area. Therefore, these findings could not be generalized to all women in northeast Mississippi.
3. The participants who completed the questionnaire overall had a post-high school education and several with graduate degrees indicating that many of administrative employees completed the surveys. However, in both industries where the survey took place the largest number of employees were blue-collar employees.
4. A limitation of bias could be a cause of the instrumentation used by the researcher in that the questionnaire had no established validity or reliability. However, the questionnaire had been peer reviewed and approved by a panel of experts for face validity within the confines of this study.

Conclusions

In this study recently conducted, several key points were derived from the data collected. First, overall the women in the population rated their health as being good or very good. Secondly, most of the women surveyed revealed that they considered heart disease their biggest health care risk. However, when evaluating each disease independently, breast cancer was chosen as the disease that most had a somewhat likely risk of developing. The third conclusion derived from the sample was the majority of the women surveyed were not getting information regarding health care from nurse practitioners. This could be that the women's primary care provider was not a nurse practitioner. Also, participants were not asked in the survey if they receive annual health care visits with a primary care provider. Therefore, the participants may not be getting their screenings to evaluate their risk of hypertension, hypercholesterolemia, diabetes mellitus, and subsequently cardiovascular disease.

Risk factor awareness was a theme that was difficult to interpret from the data as participants were only to answer the risk factor questions that pertained to their lifestyle. The participants were not evaluated as to the level of importance each risk factor played in the development of cardiovascular disease or assess their

desire to change their lifestyle if they perceived this behavior to be detrimental in development of cardiovascular disease. Data revealed in the risk factor assessment portion of the Women's Health Survey both non-modifiable and modifiable risk behaviors. Of the non-modifiable risk factors, family history and menopausal status were prevalent in this study for increased risk for development of cardiovascular disease. Modifiable risk factors revealed by the Women's Health Survey included obesity and stressful lifestyle. Surprisingly, few of the sample had risk factors for smoking, hypertension, diabetes, physical inactivity, or hypercholesterolemia. However, the mean age of the sample was 42.3 years. This could be that more chronic illnesses might not be fully evident at this point in their lives. Also, with obesity being the key risk factor present in the sample, further interventions may be necessary to prevent development of these chronic illnesses.

The knowledge portion of the questionnaire was somewhat an enlightening revelation. The majority of the women surveyed indicated they were knowledgeable of heart attack signs and symptoms. However, the sample overall failed this portion of the survey when having to identify signs and symptoms indicative of a heart attack. Therefore, these women may have had a false sense of

security related to their knowledge regarding signs and symptoms of a heart attack. Typical symptoms, such as chest pain, diaphoresis, and nausea/vomiting, were answered mostly correct by the sample. These symptoms are also those most associated with presenting heart attacks. These symptoms are also what men tend to complain of when presenting with a heart attack (Culic et al., 2002). Correct symptoms less likely chosen were those atypical in nature such as abdominal pain/discomfort, shortness of breath, and sense of impending doom. These atypical symptoms are also what women tend to more frequently present with when having a heart attack (Culic et al., 2002). This could lead to devastating results if these women had a heart attack with atypical signs and symptoms and were unaware of their significance. Blurred vision and ringing in the ears were other popular incorrect answers chosen by the sample for symptoms of a heart attack.

Implications for Nursing

A review of implications for nursing emerged for this study. Implications for nursing practice, research, and theory are described in this section.

Practice. The documented number of cases for women suffering disabilities and death due to cardiovascular disease plays a significant role for women's health in

primary care practice. With both modifiable and non-modifiable risk factors present in the development of this disease, women should be screened at each visit and educated on risk factor awareness and disease prevention. Also, symptomatology, both typical and atypical, should be reviewed with all clientele, especially women. Nurse practitioners are educated to assess and treat patients on an individual basis and holistically. Also, nurse practitioners play a large role in providing screenings and education of clients not only in the clinic but in the community as well. Additionally, pamphlets, posters, and other types of materials related to heart attacks should be prominently displayed in waiting rooms.

Research. Advanced practice nurses should conduct more research regarding facilitators and barriers of lifestyle modification in presence of the cardiovascular disease risk factors and knowledge received regarding heart attack symptomatology. The current researcher identified this need for further research as it was noted that the women in the sample were not knowledgeable of signs and symptoms of a heart attack. The importance of publishing and presenting this research at regional and national health care meetings is crucial.

Education. Findings of this study underscore the importance of comprehensive assessment of clients

including perceived health status. It is essential that nurse practitioners be educated to provide the most recent and effective strategy for involving patients in their health care management. Advanced practice nurses, through continuing education, should be able to provide clients risk awareness for disease processes and baseline knowledge of specific symptoms reportable to health care providers.

Theory. Pender's Health Promotion Model identifies cognitive-perceptual factors that influence care providers to initiate behaviors that are focused on health promotion and disease prevention. The beliefs of primary health care providers about primary prevention, importance of health, and perceived benefits to health promoting behaviors are concepts from the Health Promotion Model that are applicable to this study.

Recommendations

The following results were based on the results of the current study:

1. Replication of study with larger sample of women to include a more demographically diverse group.
2. Replication of studies in a variety of settings other than industrial sites.

3. Replication of study in diverse settings to establish validity and reliability of the Women's Health Survey.
4. Replication of the study addressing women's choices for lifestyle modifications in determining which behavior affects their risk of development of chronic disease and interventions they would select to decrease their risk.
5. Conduction of qualitative research to explore women's perception of risk for cardiovascular disease after diagnosis.

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APPENDIX A

WOMEN'S HEALTH SURVEY

Women's Health Survey

Please check (✓) and or fill in the appropriate response.

1. Age:_____

2. Marital status
   - ❑ a. Single
   - ❑ b. Married
   - ❑ c. Divorced
   - ❑ d. Widowed

3. Race
   - ❑ a. Caucasian
   - ❑ b. African American
   - ❑ c. Latin American
   - ❑ d. Oriental
   - ❑ e. Other

4. Highest educational level completed
   - ❑ a. Did not finish high school
   - ❑ b. GED/high school diploma
   - ❑ c. College education without degree completion
   - ❑ d. Bachelor's degree
   - ❑ e. Graduate degree

5. How would you describe your health status?
   - ❑ a. Very good
   - ❑ b. Good
   - ❑ c. Average
   - ❑ d. Poor

6. What do you perceive as your biggest health risk? (Choose one)
   - ❑ a. HIV/AIDS
   - ❑ b. Breast cancer
   - ❑ c. Heart disease
   - ❑ d. Infectious disease
   - ❑ e. Diabetes
   - ❑ f. Hypertension
   - ❑ g. Ovarian/cervical cancer
   - ❑ h. Osteoporosis

7. Do you have a first blood relative (mother, father, brother, or sister) who was diagnosed with any of the following chronic diseases? (Check all that apply)

- ❑ a. Cancer
- ❑ b. Heart disease
- ❑ c. Diabetes
- ❑ d. Hypertension

8. What is your perception of your risk for these diseases?

	Very likely	Somewhat likely	Not likely
a. HIV/AIDS	_____	_____	_____
b. Breast cancer	_____	_____	_____
c. Heart disease	_____	_____	_____
d. Infectious disease	_____	_____	_____
e. Diabetes	_____	_____	_____
f. Hypertension	_____	_____	_____
g. Ovarian/cervical cancer	_____	_____	_____
h. Osteoporosis	_____	_____	_____

9. Have you ever been informed by a health care provider that you are at risk for developing any of the following?

a. HIV/AIDS	_____ Yes	_____No
b. Breast cancer	_____ Yes	_____No
c. Heart disease	_____ Yes	_____No
d. Infectious disease	_____ Yes	_____No
e. Diabetes	_____ Yes	_____No
f. Hypertension	_____ Yes	_____No
g. Osteoporosis	_____ Yes	_____No
h. Ovarian/cervical cancer	_____ Yes	_____No

If yes, who informed you?

- ❑ a. Medical doctor
- ❑ b. Ob/Gyn specialist
- ❑ c. Nurse practitioner
- ❑ d. Health fair/screening
- ❑ e. Other specialist (write in):_____
- ❑ f. Media: news, magazines, TV, Internet (write in):

_____

10. Have you ever been diagnosed with any of the following (check all that apply)?

a. Heart attack	_____ Yes	_____No
b. Coronary artery bypass graft surgery	_____ Yes	_____No
c. Percutaneous angioplasty	_____ Yes	_____No
d. Congestive heart failure	_____ Yes	_____No
e. Angina/recurrent chest pain	_____ Yes	_____No
f. Irregular heart rate/rhythm	_____ Yes	_____No
g. Hypertension	_____ Yes	_____No
h. Diabetes	_____ Yes	_____No
i. Breast cancer	_____ Yes	_____No
j. Lung cancer	_____ Yes	_____No
k. Ovarian/cervical cancer	_____ Yes	_____No

11. If a current smoker, how many years have you smoked?_____
On average, how many packs a day do you smoke?_____

If a previous smoker, how many years did you smoke?_____
On average, how many packs a day did you smoke?_____

12. Are you a diabetic (high blood sugar)?
❑ a. Yes ❑ b. No

If yes, what does your sugar average?
❑ a. More than > 200 blood sugar
❑ b. 150 to 199
❑ c. 110 to 149
❑ d. Less than < 109
❑ e. Don't know

13. Write in your height:_____ Write in your weight:_____

14. If you exercise, do you exercise for 30 minutes a day?
❑ a. Yes ❑ b. No

How many times a week do you exercise for at least 30 minutes a day? Write in: _____

15. Do you know your cholesterol level?
❑ a. Yes ❑ b. No

Write in your cholesterol level:_____

16. What was your last recorded blood pressure?_____
❑ Don't know

17. Have you been diagnosed with depression or anxiety disorder?
❑ a. Yes ❑ b. No

18. Are you frequently angry, irritable, tense, stressed, or always in a hurry?
❑ a. Yes ❑ b. No

19. Do you still have a menstrual cycle?
❑ a. Yes ❑ b. No

20. Do you know the signs and symptoms of a heart attack?
❑ a. Yes ❑ b. No

Check the symptoms that you believe apply to having a heart attack:

	Yes	No
a. Shortness of breath	_____	_____
b. Diarrhea	_____	_____
c. Dizziness or weakness	_____	_____
d. Joint pain	_____	_____
e. Abdominal discomfort	_____	_____
f. Chest pain/tightness	_____	_____
g. Blurred vision	_____	_____
h. Arm or shoulder pain	_____	_____
i. Nausea/vomiting, indigestion	_____	_____
j. Fever	_____	_____
k. Panic sensation/impending doom	_____	_____
l. Sweating for no apparent reason	_____	_____
m. Difficulty voiding (urinating)	_____	_____
n. Pounding or irregular heartbeat	_____	_____
o. Jaw or neck pain	_____	_____
p. Constipation	_____	_____
q. Ringing in the ears	_____	_____

APPENDIX B

APPROVAL OF THE COMMITTEE ON USE OF HUMAN SUBJECTS IN EXPERIMENTATION OF MISSISSIPPI UNIVERSITY FOR WOMEN

MISSISSIPPI UNIVERSITY FOR WOMEN

Admitting Men Since 1982

Office of Academic Affairs
Eudora Welty Hall
W-Box 1603
Columbus, MS 39701
(662) 329-7142
(662) 329-7141 Fax

www.muw.edu

March 3, 2003

Ms. Kimberly K. Marlar
c/o Dr. Lynn Chilton
P. O. Box W-910
Campus

Dear Ms. Marlar:

I am pleased to inform you that the members of the Committee on Human Subjects in Experimentation have approved your proposed research provided the consent form contains a statement that failure to participate will in no way affect any standard of care.

I wish you much success in your research.

Sincerely,

Vagn K. Hansen, Ph.D.
Provost and Vice President
for Academic Affairs

VH:wr

cc: Mr. Jim Davidson
Dr. Lynn Chilton
Dr. Mary Pat Curtis

APPENDIX C

LETTER REQUESTING PERMISSION TO CONDUCT STUDY

1724 Webster Street
Corinth, Mississippi 38834
662-665-9092
ckmarlar@avsia.com

xxxxxxxxx
xxxxxxxx Inc.
xxxxx Drive
Corinth, MS 38834

Dear xxxxxx:

As a graduate student at the Mississippi University for Women, I am required to conduct a research study in partial fulfillment of the Master of Science degree in Nursing. I plan to research the perception of risk of women and their knowledge regarding cardiovascular disease. The purpose of this study is to evaluate women's knowledge of cardiovascular risk factors and assess their perception of risk for this disease. I am requesting your assistance and written permission to survey the female employees at XXXXXX Industries in a Women's Health Survey. The survey will take approximately 15 minutes of their time. I would like to coordinate this with the corporate health fair and screenings that will take place in February 2003.

Participation in the study will be strictly voluntary and the subjects will give written informed consent if they do wish to participate. The participants are free to withdraw from the study at any time before returning the survey to the researcher. The participants will fill out a survey with questions regarding their perception of risk for disease, their knowledge of risk factors, and signs and symptoms associated with cardiovascular disease. All information collected will be kept strictly confidential, and the participants will not be asked to sign their names to the questionnaires.

Please find enclosed a copy of this letter as well as the drafted consent form for your records. Please sign the original letter and return it to me in the enclosed envelope.

Sincerely,

Kimberly Kuykendall-Marlar

Permission Granted:_____ Permission Denied:_____

Signature:_____ Date: _____

APPENDIX D

CONSENT FORM

TITLE
Women's Health Survey: Exploring Perceptions of Health, Disease, and Knowledge of Risk Factors That Women Face.

PRINCIPAL INVESTIGATOR: Kimberly Marlar, BSN

PURPOSE
Your cooperation is requested in conducting this research. The purpose of this research is to gain a better understanding of the actual knowledge level women have regarding their personal health and perception of risk. Employment sites in this area were chosen in order to obtain a diversified population for the research results. You were selected as a possible participant because your place of employment was chosen as a selected site.

PROCEDURES
If you decide to participate, you will be asked to complete a survey regarding women's health issues and perceptions of risk for disease. The survey will take approximately 10-15 minutes. The questionnaires will ask information regarding age, educational level, personal health history, family medical history, individual perceptions of risk for listed diseases, and knowledge of impending symptoms of a heart attack. Participation in this research is completely voluntary. You have the right to refuse to participate in this study up until the time the survey has been returned to the researcher.

BENEFITS AND RISKS
You may benefit from participation in this study by becoming more aware of the health care issues women face and how women perceive their risk. You may also benefit in knowing you provided information that may help to improve healthcare for women. There is no physical risk involved in your participation, and any psychological risk is minimal. The major inconvenience will be the time it will take to complete the questionnaire.

COSTS
There is no cost to participate in this study, and no compensation will be made to study participants.

CONFIDENTIALITY
Your name will not appear on any questionnaires. Study participants will not be identified in any way in the report of this study. All surveys and consent forms will be sealed in separately marked plain envelopes and deposited in return box at time of completion. Your decision whether or not to participate in this study will not affect your employment with this industry. Your signature indicates that you have read the information provided and agree to participate in this study.

Signature of Participant:_____ Date:_____